DOCID: 4050988

~~SECRET SPOKE~~

UNITED STATES GOVERNMENT

memorandum

DATE: 9 June 1993 Z-043-93

PLS FORWARD TO ADMIRAL STUDEMAN FOR INFO.

REPLY TO ATTN OF: Z

SUBJECT: CIA KRYPTOS Sculpture - Challenge and Resolution ~~(FOUO)~~ - **INFORMATION MEMORANDUM**

TO: DIR

THRU: D/DIR, EXEC/DIR, DDO

Great Story!

1. ~~(FOUO)~~ The KRYPTOS sculpture, located at the entrance and in the courtyard of the new CIA headquarters, consists of a series of stone "pages" containing code which begins as International Morse and increases in complexity as the stonework extends into the courtyard. Inserted between these stone "pages" is a flat copper sheet engraved with letters and symbols - the enciphered message - that is the focus of this challenge.

2. ~~(FOUO)~~ In November, a cadre of cryptanalysts assigned to Z Group enthusiastically responded to the challenge. Within one month, three of the four cipher systems used to encrypt the sculpture's plain text had been diagnosed and completely exploited. The cryptographies employed for the encryption of these three parts involved two periodic polyalphabetic substitution ciphers and a keyed columnar transposition cipher. The exploitation of the sculpture's first three parts constitutes a readability of approximately 89%. The final 97 characters continue to elude solution.

3. ~~(FOUO)~~ Attached, for your review, is a brief description of the employed cryptographies and the plain text derived from the three exploited portions of the KRYPTOS sculpture. If your schedule permits, we would be happy to present a 15-minute briefing on the KRYPTOS sculpture solution and introduce you to the cryptanalysts responsible for the success against this cipher.

[redacted]

(b)(3)-P.L. 86-36

3 Encls:
1. Copy of Sculpture Picture
2. Copy of Cipher
3. Description of Cryptographies

cc: Z4
Z43

Derived fm: NSA Class. Guide 3.42-97
29 May 1997
Declassify on: X1, X5

~~SECRET SPOKE~~

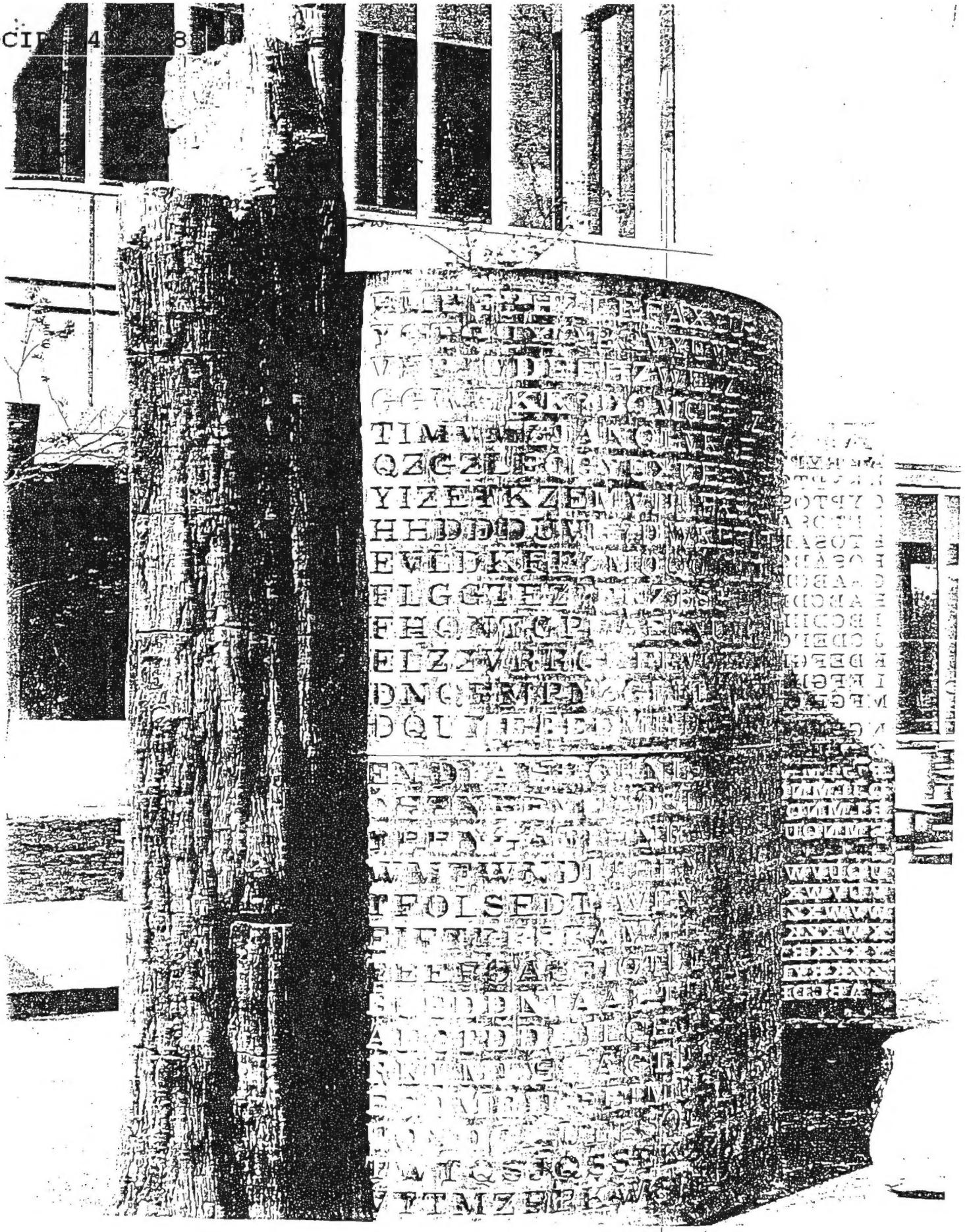
~~FOR OFFICIAL USE ONLY~~

OPTIONAL FORM NO. *46695*

6-130

Some Exceptions

Approved for Release by NSA on 05-21-2013, FOIA Case # 61191



(U)

DOCID: 4050988

THE KRYPTOS SCULPTURE CIPHER

~~(D)~~

E M U F P H Z L R F A X Y U S D J K Z L D K R N S H G N F I V J
Y Q T Q U X Q B Q V Y U V L L T R E V J Y Q T M K Y R D M F D
V F P J U D E E H Z W E T Z Y V G W H K K Q E T G F Q J N C E
G G W H K K ? D Q M C P F Q Z D Q M M I A G P F X H Q R L G
T I M V M Z J A N Q L V K Q E D A G D V F R P J U N G E U N A
Q Z G Z L E C G Y U X U E E N J T B J L B Q C R T B J D F H J R R
Y I Z E T K Z E M V D U F K S J H K F W H K U W Q L S Z F T I
H H D D D U V H ? D W K B F U F P W N T D F I Y C U Q Z E R E
E V L D K F E Z M O Q Q J L T T U G S Y Q P F E U N L A V I D X
F L G G T E Z ? F K Z B S F D Q V G O G I P U F X H H D R K F
F H Q N T G P U A E C N U V P D J M Q C L Q U M U N E D F Q
E L Z Z V R R G K F F V O E E X B D M V P N F Q X E Z L G R E
D N Q F M P N Z G L F L P M R J Q Y A L M G N U V P D X V K P
D Q U M E B E D M H D A F M J G Z N U P L G E W J L L A E T G
E N D Y A H R O H N L S R H E O C P T E O I B I D Y S H N A I A
C H T N R E Y U L D S L L S L L N O H S N O S M R W X M N E
T P R N G A T I H N R A R P E S L N N E L E B L P I I A C A E
W M T W N D I T E E N R A H C T E N E U D R E T N H A E O E
T F O L S E D T I W E N H A E I O Y T E Y Q H E E N C T A Y C R
E I F T B R S P A M H H E W E N A T A M A T E G Y E E R L B
T E E F O A S F I O T U E T U A E O T O A R M A E E R T N R T I
B S E D D N I A A H T T M S T E W P I E R O A G R I E W F E B
A E C T D D H I L C E I H S I T E G O E A O S D D R Y D L O R I T
R K L M L E H A G T D H A R D P N E O H M G F M F E U H E
E C D M R I P F E I M E H N L S S T T R T V D O H W ? O B K R
U O X O G H U L B S O L I F B B W F L R V Q Q P R N G K S S O
T W T Q S J Q S S E K Z Z W A T J K L U D I A W I N F B N Y P
V T T M Z F P K W G D K Z X T J C D I G K U H U A U E K C A R

UNCLASSIFIED

PART 1

~~(SC)~~

Cryptography: Periodic Polyalphabetic Substitution employing 10 alphabets

Plain component: Keyword mixed sequence based on **KRYPTOS**

Cipher component: Keyword mixed sequence based on **KRYPTOS**

Repeating Key: **PALIMPSEST**

Index letter: **K**

P:	**K**	**R**	**Y**	**P**	***T***	**O**	***S***	**A**	***B***	**C**	**D**	***E***	**F**	**G**	**H**	**I**	**J**	**L**	**M**	***N***	**Q**	***U***	**V**	***W***	**X**	**Z**
C1:	P	T	O	S	A	B	C	D	***E***	F	G	H	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y
C2:	A	B	C	D	E	F	G	H	I	J	L	***M***	N	Q	U	V	W	X	Z	K	R	Y	P	T	O	S
C3:	L	M	N	Q	***U***	V	W	X	Z	K	R	Y	P	T	O	S	A	B	C	D	E	F	G	H	I	J
C4:	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y	P	T	O	S	A	B	C	D	E	***F***	G	H
C5:	M	N	Q	U	V	W	X	Z	K	R	Y	***P***	T	O	S	A	B	C	D	E	F	G	H	I	J	L
C6:	P	T	O	S	A	B	C	D	E	F	G	***H***	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y
C7:	S	A	B	C	D	E	F	G	H	I	J	L	M	N	Q	U	V	W	X	***Z***	K	R	Y	P	T	O
C8:	E	F	G	H	I	J	***L***	M	N	Q	U	V	W	X	Z	K	R	Y	P	T	O	S	A	B	C	D
C9:	S	A	B	C	D	E	F	G	H	I	J	L	M	N	Q	U	V	W	X	Z	K	***R***	Y	P	T	O
C10:	T	O	S	A	B	C	D	E	***F***	G	H	I	J	L	M	N	Q	U	V	W	X	Z	K	R	Y	P

EMUFPHZLRF AXYUSDJKZL DKRNSHGNFI VJYQTQUXQB

BETWEENSUB TLESHADING ANDTHABSCE NCEOFLIGHT

QVYUVLLTRE VJYQTMKYRD MFD

LIESTHENUA NCEOFIQLUS ION

~~(FOUO)~~ Respaced and punctuated, it reads:

"BETWEEN SUBTLE SHADING AND THE ABSENCE OF LIGHT LIES THE NUANCE OF ILLUSION"

~~SECRET SPOKE~~

PART 2

~~SCT~~

Cryptography: Periodic Polyalphabetic Substitution employing 8 alphabets

Plain component: Keyword mixed sequence based on **KRYPTOS**

Cipher component: Keyword mixed sequence based on **KRYPTOS**

Repeating Key: **ABSCISSA**

Index letter: **K**

```
 P:KRYPTOSABCDEFGHIJLMNQUVWXZ
C1:ABCDEFGHIJLMNQUVWXZKRYPTOS
C2:BCDEFGHIJLMNQUVWXZKRYPTOSA
C3:SABCDEFGHIJLMNQUVWXZKRYPTO
C4:CDEFGHIJLMNQUVWXZKRYPTOSAB
C5:IJLMNQUVWXZKRYPTOSABCDEFGH
C6:SABCDEFGHIJLMNQUVWXZKRYPTO
C7:SABCDEFGHIJLMNQUVWXZKRYPTO
C8:ABCDEFGHIJLMNQUVWXZKRYPTOS
```

VFPJUDEE HZWETZYV GWHKKQET GFQJNCEG GWHKK?DQM
ITWASTOT ALLYINVI SIBLEHOW STHATPOS SIBLE?THE

CPFQZDQM MIAGPFXH QRLGTIMV MZJANQLV KQEDAGDV
YUSEDTHE EARTHSMA GNETICFI ELDXTHEI NFORMATI

FRPJUNGE UNAQZGZL ECGYUXUE ENJTBJLB QCETBJDF
ONWASGAT HEREDAND TRANSMIT TEDUNDER GROUNDTO

HRRYIZET KZEMVDUF KSJHKFWH KUWQLSZF TIHHDDDU
ANUNKNOW NLOCATIO NXDOESLA NGLEYKNO WABOUTTH

VH?DWKBFU FPWNTDKI YCUQZERE EVLDKFEZ MOQQJLTT
IS?THEYSH OULDITSB URIEDOUT THERESOM EWHEREXW

UGSYQPFE UNLAVIDX FLGGTEZ?F KZBSFDQV GOGIPUFX
HOKNOWST HEEXACTL OCATION?O NLYWWTHI SWASHISL

HHDRKFFH QNTGPUAE CNUVPDJM QCLQUMUN EDFQELZZ
ASTMESSA GEXTHIRT YEIGHTDE GREESFIF TYSEVENM

VRRGKFFV OEEXBDMV PNFQXEZL GREDNQFM PNZGLFLP
INUTESSI XPOINTFI VESECOND SNORTHSE VENTYSEV

~~SECRET SPOKE~~

~~SECRET SPOKE~~

MRJQYALM GNUVPDXV KPDQUMZB EDMHDAFM JGZNUPLG
ENDEGREE SEIGHTMI NUTESFOR TYFOURSE CONDSWES

EWJLLAET G
TIDBYROW S

~~(FOUO)~~ Respaced and punctuated, it reads:

"IT WAS TOTALLY INVISIBLE. HOW'S THAT POSSIBLE? THEY USED THE EARTH'S MAGNETIC FIELD. THE INFORMATION WAS GATHERED AND TRANSMITTED UNDERGROUND TO AN UNKNOWN LOCATION. DOES LANGLEY KNOW ABOUT THIS? THEY SHOULD. ITS BURIED OUT THERE SOMEWHERE. WHO KNOWS THE EXACT LOCATION? ONLY W.W. THIS WAS HIS LAST TRANSMISSION. THIRTY-EIGHT DEGREES, FIFTY-SEVEN MINUTES, SIX POINT FIVE SECONDS NORTH. SEVENTY-SEVEN MINUTES, FORTY-FOUR SECONDS WEST. I.D. BY ROWS."

~~(SC)~~ **Note:** W.W. is presumed to be William Webster. The coordinates refer to the location of or a location within the Central Intelligence Agency. The significance of I.D. BY ROWS remains undetermined.

~~SECRET SPOKE~~

~~SECRET SPOKE~~

PART 3

~~(SC)~~

Cryptography: Keyed Columnar transposition
Matrix size: Incompletely filled 4 X 86
Specific key: **KRYPTOS**, numerically keyed and repeated 13 times
(first 12 columns listed below)
Route: Bottom to top

```
SLOWLYDESPARATLYSLOWLYTHEREMAINSOFPASSAGEDE
ASREMOVEDWITHTREMBLINGHANDSIMADEATINYBREACH
OLEALITTLEIINSERTEDTHECANDLEANDPEEREDINTHEH
FLICKERBUTPRESENTLYDETAILSOFTHEROOMWITHINEM
 1      1      1      9      8      7
 2      1      0
```

```
BRISTHATENCUMBEREDTHELOWERPARTOFTHEDOORWAYW
INTHEUPPERLEFTHANDCORNERANDTHENWIDENINGTHEH
OTAIRESCAPINGFROMTHECHAMBERCAUSEDTHEFLAMETO
ERGEDFROMTHEMISTXCANYOUSEEANYTHINGQ
 6      5      4      3      2      1
```

(U) "SLOWLY DESPARATLY SLOWLY THE REMAINS OF PASSAGE DEBRIS THAT ENCUMBERED THE LOWER PART OF THE DOORWAY WAS REMOVED. WITH TREMBLING HANDS I MADE A TINY BREACH IN THE UPPER LEFT HAND CORNER, AND THEN, WIDENING THE HOLE A LITTLE, I INSERTED THE CANDLE AND PEERED IN. THE HOT AIR ESCAPING FROM THE CHAMBER CAUSED THE FLAME TO FLICKER, BUT PRESENTLY, DETAILS OF THE ROOM WITHIN EMERGED FROM THE MIST X CAN YOU SEE ANYTHING Q"

Note: The above is a paraphrase from The Tomb of Tut-Ankh-Amen written by Mr. Howard Carter.

~~SECRET SPOKE~~